

**MANCHESTER SCHOOL  
OF ARCHITECTURE**

# *Skyscrapers the Limit*



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**MSA  
LIVE 21**

## Team

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## Partners

We partnered up with Manchester Health Academy, a secondary school based in Wythenshawe, Manchester. Their mission statement is to provide a rich curriculum for the kids of this area to encourage widening participation which is embroidered into their teaching practice.

Their courses cover a diverse range of subjects to enrich the student's knowledge and skills so that they can transfer and apply them to the work environment, through the help of several trust funds such as the Manchester Uniteds Trust Fund, which collaborated with the school to create engaging and fun activities that were published on their website for people to watch. This was key during a time of uncertainty as a result of the pandemic.

In our group, we want to emulate these beliefs through our project as it tests our knowledge on widening participation and how we can present this to the students.

# Agenda

## Skyscrapers the Limit

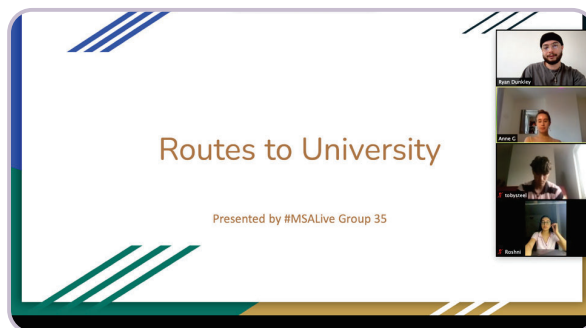
We are group 35 and, as our name implies, we want to demonstrate to our collaborators that there should be no limit to your potential. A fitting statement that matches our partners vision of providing their students with the best educational experience before deciding what they want to do in the future. We've been working closely with one of the transition mentors at the school to create a fun and invigorating set of activities, that would be completed over a number of days. In doing so, we hope to show the students the types of opportunities that are available when aiming for higher education.

These activities will be recorded and collated so that we can work with our team members to produce our final outputs of the work they produce. This would be presented to the MHA students to showcase their work as a finished product and the endless possibilities of where their creativity and imagination can take them. The session would then conclude with a brief presentation on the types of routes they could take for attending university, as well as the other types of opportunities available.

Prior to this, we would be working with our newly formed team members from the BA to create these activities, ones which aren't high maintenance (don't require a lot of materials) and can be done at home or in school. These tasks would be split into individual groups that focus on each component of architecture: **Modelmaking, Drawing, Structure, Internal Environments**.

Additionally this will give us the chance to acquaint ourselves with the BA cohort and give them tutorials on software such as Photoshop and AutoCAD, software which they might not be familiar with that we found very useful through our architectural journey in the course.

We look forward to give the best experience to both the students at the MHA and the MSA collectively.



Here we have a QR code to our presentation video we held, showcasing our routes into university. It is also available by clicking this link: <https://www.youtube.com/watch?v=hua6XVJnNN4>

# Modelmaking

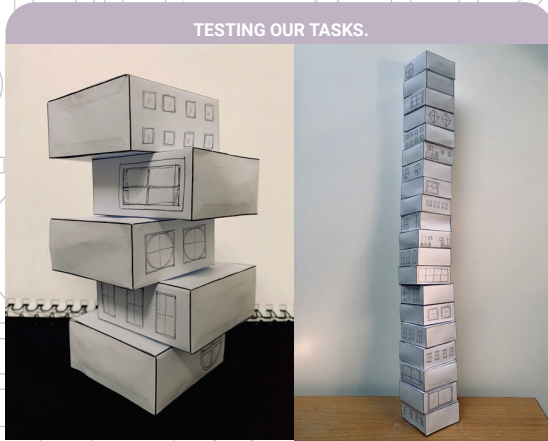
**01:** The model making group focused on first creating tasks to engage 10-15 year old in the study of architecture. The BA students worked together with the MArch students to created 2 task pages consisting of:

- One task
- Tips and tricks for the students

- Examples of their own work.

**02:** The next task was to create an introduction presentation and video, which would introduce the students to model making and its role in the architectural design process. The video was recorded and edited by the team.

**03:** With the help of tutorials given by the master students the BA students worked together with the MArch students to create 'outputs' which would be used to show the students how their designs can be developed with the skills we learned over our architecture course. This model making group focused on modeling a tower which was designed with the help of the task page created earlier in the week. The students then learned digital software like twinmotion and photoshop to produce a presentation board.

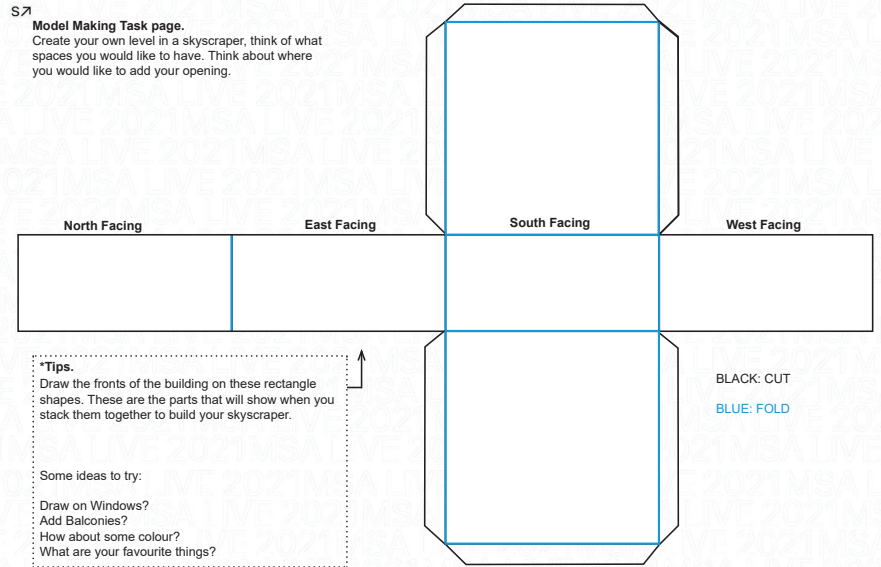


QR link to model making video

STUDENTS WORK PRODUCED IN THE RHINO TUTORIAL.

# Process

**S7**  
**Model Making Task page.**  
 Create your own level in a skyscraper, think of what spaces you would like to have. Think about where you would like to add your opening.



**S7**  
**Introduction.**  
 Split into groups of 5 and be ready to complete the creation of your skyscraper.

- Step 01:** Draw in your design and cut out opening for windows.
  - Tips:**
    - What spaces would you have inside?
    - What style would you like to focus on?
    - What size/shape would your windows be?
- Step 02:** Cut out the net.
  - Tips:**
    - Try keep your cuts along the lines.
- Step 03:** Put together the net.
  - Tips:**
    - Try to keep your overlaps straight
    - Try to keep the folds aligned.
- Step 04:** Create an arrangement together in your groups of 5.
  - Tips:**
    - Think about loads, will it be able to support more levels above?
- Step 05:** Put your group arrangements together with the other groups and see how high you can stack it !
  - Tips:**
    - Which arrangement allows the skyscraper to be taller?
    - Which option looks the best?

# Final Output

**SECTION.**

**RE-CYCLE TOWER**  
Using left over construction materials to create a new build high-riso.

**CONSTRUCTION WASTE**

400 MT PER YEAR → 100 MT PER YEAR

UK Construction sector uses 400 million tonnes of material every year, which results in 100 million tonnes of waste being processed.

**SOCIAL ISSUES**

320,000 HOMES

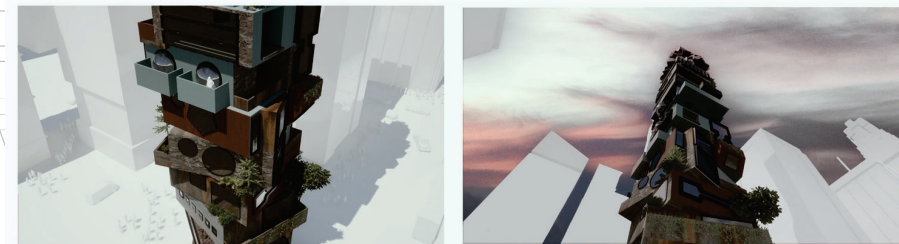
£9.14B PAID IN COSTS

20% MORE EXPENSE

9TH LARGEST IMPORT

WASTE → SORTING → VALUE

The use of different type, style and shape of windows would create interesting and dynamic internal environments.



**LEVEL 5 FLOOR PLAN 1:200**

**LEVEL 20 FLOOR PLAN 1:200**

**LEVEL 15 FLOOR PLAN 1:200**

**CONSTRUCTION WASTE PROBLEM**

32% of landfill comes from the construction and demolition of buildings in the UK

55% Currently in the UK the construction industry accounts for 55% of CO2 emissions

**Over-stocking**

The waste produced by the construction industry is largely due to overstocking of products which then end up in landfills

Each floor of the building is different based on the available waste materials and the quantity, the building would be constructed using a range of materials from concrete to timber.

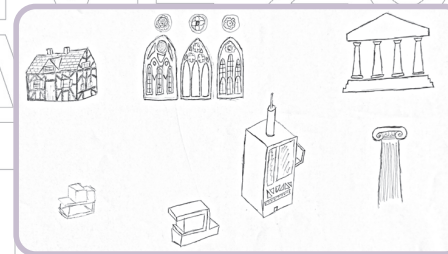
The master suites would have views over the city and benefit from a private garden/

Vegetation would also be used a barrier to sound and would present on most levels of the highrise.

# Drawing

Drawing is a fundamental part of Architecture. Through our tasks we've curated, we aim to influence high school students on art and design practises used everyday. In these next few pages we will be showcasing our process which led up to our final outputs that were set for the students at the MHA.

## Process



Initial Ideas for styles



The teams' setup

## Final tasklet sheet

skyscrapers the limit

**ISOMETRIC DRAWING TASK**

S7

**Step by step**

- 1 Draw an outline of a cube using the guidelines provided, this style of drawing in architecture is called isometric!
- 2 Choose one material from the left and one style of architecture from the right side below in order to design your own building. Using the pictures provided for each choice to help, draw onto the two faces of the cube with windows, doors and anything you wish your building to have! Use the grid on the paper to help.
- 3 Once you are done with your drawing, follow the guidelines to cut out your building from the page.
- 4 Use a glue stick and apply it to the top face only, where you have not drawn on.
- 5 Stick it on to the drawings that your friends have done using the sticky side to create one large tower building! Take a photo when you are done!

**Materials**

- Brick
- Greenery
- Timber
- Stone

**Style**

- Tudor
- Antiquity
- Gothic
- Modern

NET

Here is the tasklet page that we produced over the week. The idea behind it was for the students to draw and cut out the net, using the material and style which would be chosen by them. To finish they would be asked to stick each piece together to form a 'skyscraper'.

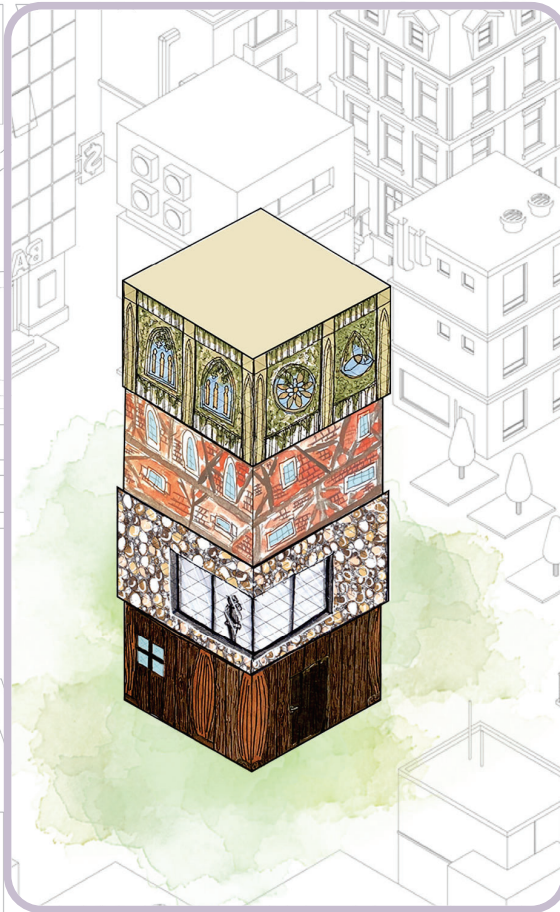
# Process

As a group, we decided to create a simple step-by-step video guide on how to use the sheet template as we weren't able to facilitate a live session with our collaborating school. This made it easier for us to demonstrate the ease of the task, additionally this opens up the possibility of sharing these products with other schools that could benefit from these tasklet sheets.

After completing the sheet we all cut out and 'stuck' our drawings together in a collage to be shown as a representation of the work we expect to see from our partners. The idea would then be to render those pieces of work and exhibit them to the students at the MHA. Overall the general response to this exercise was fun and inclusive of each persons talents and ability to cooperate with one another. We strongly believe that this tasklet will be a hit with the younger groups who are still unceratin about what they want to do in the future.

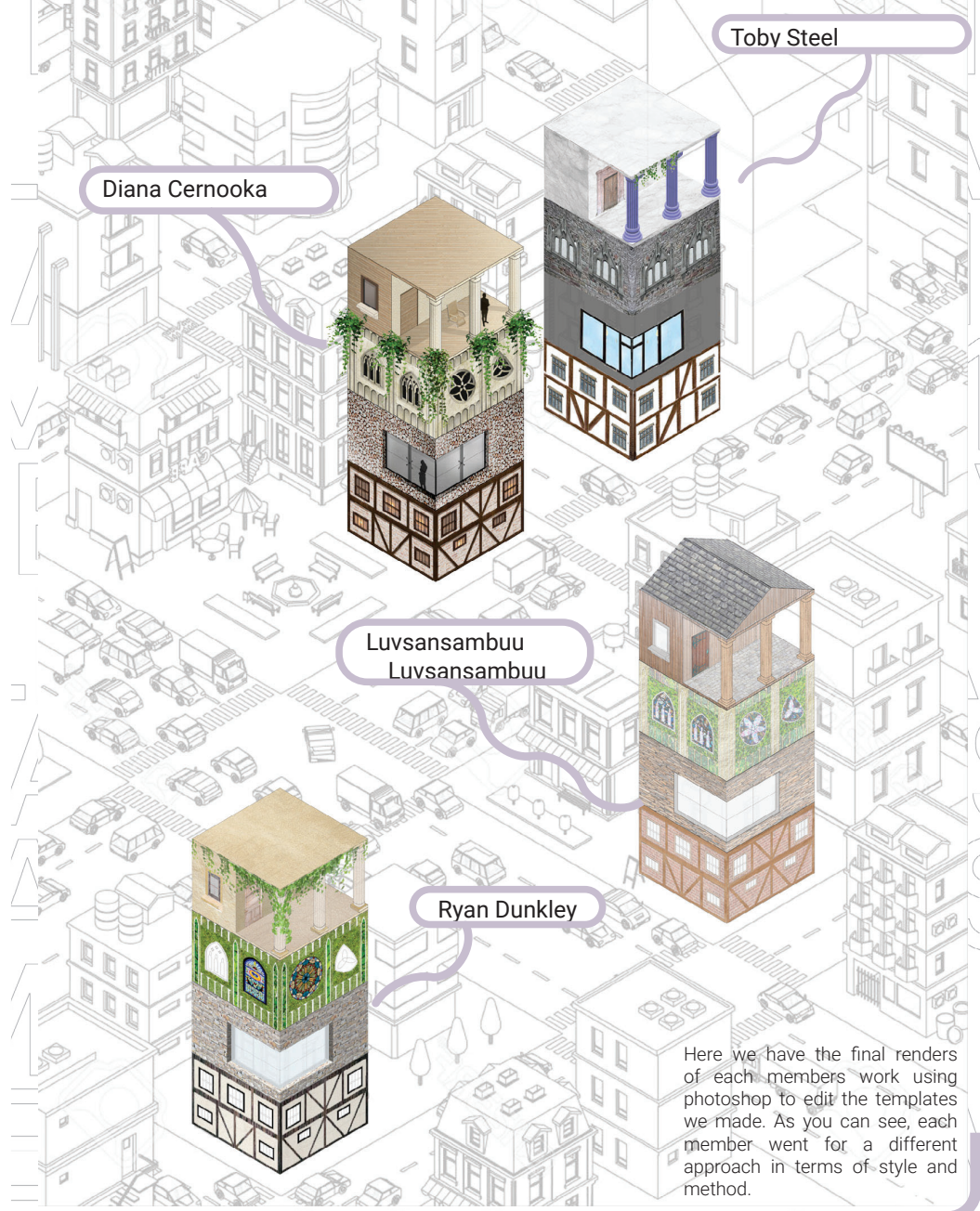


The Drawing Team on-call



Collage of our work

# Final Output



Here we have the final renders of each members work using photoshop to edit the templates we made. As you can see, each member went for a different approach in terms of style and method.



Link: <https://www.youtube.com/watch?v=BpDE1v-1Hb4&t=15s>

# Structure

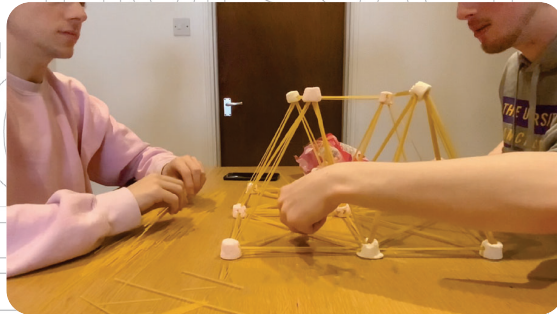
Our group was tasked with creating a fun and engaging activity for the students to take part in. The idea was to demonstrate how architecture can be interpreted through the use of everyday household items and/or food products.

In a sub-group, we were designated the task of teaching about structure. To do this we brainstormed on the first day and set up a set of outputs to achieve in the two weeks. These were: two instructional sheets which accompanied a short video of us completing those tasks.



The team watching a video on structural representation

Our initial work in these images is us experimenting with materials and shapes to test how we can teach kids about the basic principles in architecture, our chosen theme, bracing.



Testing of the structure

We designed our tasks to be two 30 minute sessions that can be done in after school class, and were designed to be as fun and engaging as possible.



Video tutorial demonstrating the steps

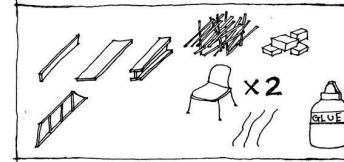
# Process

## Skyscraper's the Limit STRUCTURE

Time Required: 30 minutes

### Materials you need:

- 20x Rectangle Balsa Wood sticks
- Bottle of uhu Glue
- String
- Weights (anything will do!)
- Two Chairs or tables to support on both sides



The aim of this exercise is to understand to gain a basic understanding into the structure of modern buildings. By the end, you will understand what bracing is and how important it is for the structure of a building, how much weight can you add to your bridges?

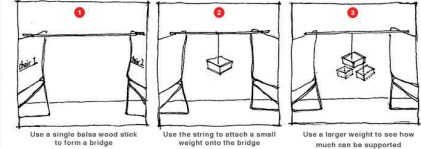
### SCAN ME!

The following QR code will give you a brief insight into the importance of structure. It will also give you an example to how you can construct your towers, good luck!

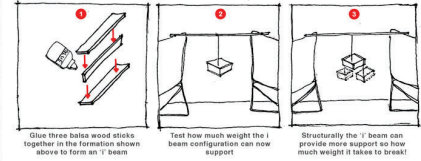


## Exercise 1

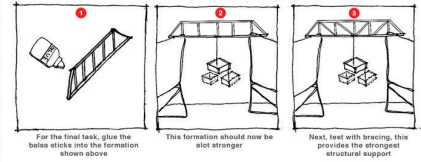
### TASK 1 - 5 MINUTES



### TASK 2 - 10 MINUTES



### TASK 3 - 15 MINUTES

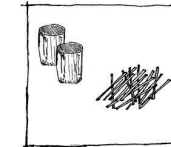


## Skyscraper's the Limit STRUCTURE

Time Required: 30 minutes

### Materials you need:

- 500g pack of spaghetti
- marshmallows
- Table to work on

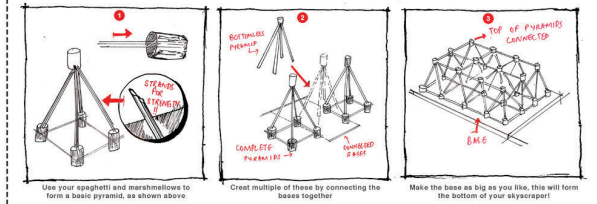


This second exercise will build on your knowledge from the last task. This task develops further the importance of bracing construct the tallest structure that you can.

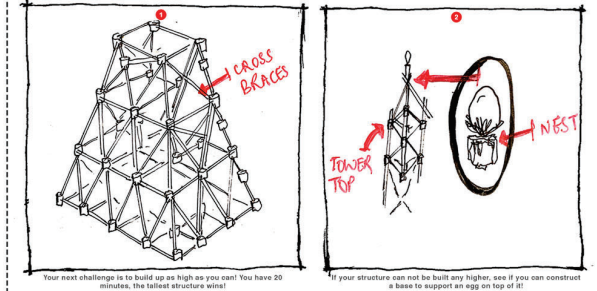


## Exercise 2

### TASK 1 - 10 MINUTES



### TASK 2 - 20 MINUTES

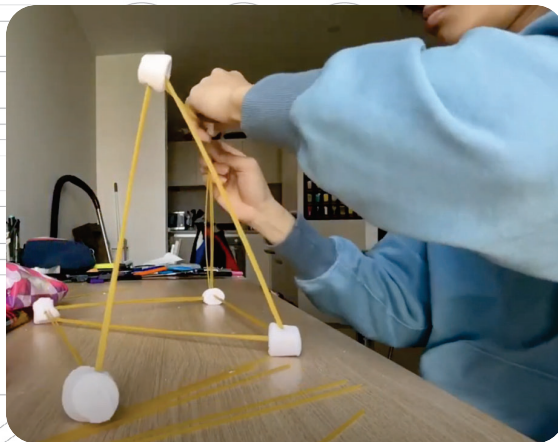
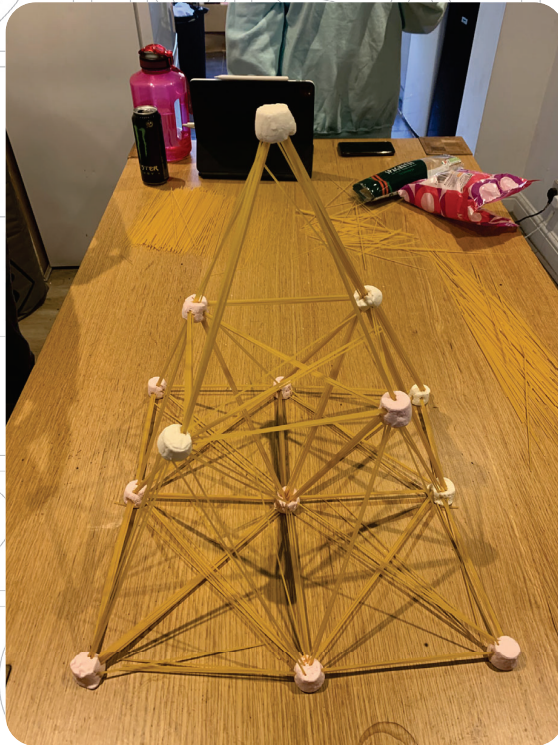


Your next challenge is to build up as high as you can! You have 20 minutes, the tallest structure wins!

If your structure can not be built any higher, see if you can construct a base to support an egg on top of it!

## Final Outputs

With the tasklet set, each member of the group were asked to create their own structure using the marshmallow and spaghetti. Once the task was complete, we were able to see what kinds of structural methods each of us used to design. As a conclusion, we agreed that the use of triangles produce the strongest structure in terms of dead and lateral loads. This would be emphasised in the sheet which the students are provided to print off for use in the activity.



## Internal Environments

"Shadow is the creation where light cannot reach. It is shadow that help us define forms."

"Structure is the creator of shadow and surface is the receiver of light and shadow."  
~Stephanie Shen.

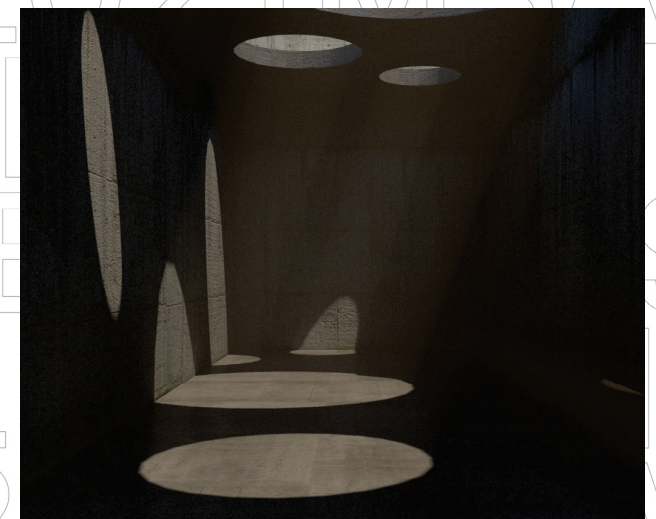
Light is the natural agent that stimulates light. It is light that first enables "What You See"  
~Aline Alagem.

The use of natural light in Modern architecture is used to make buildings look and feel more open, different to the use of natural light as a metaphor of god in classical architecture.

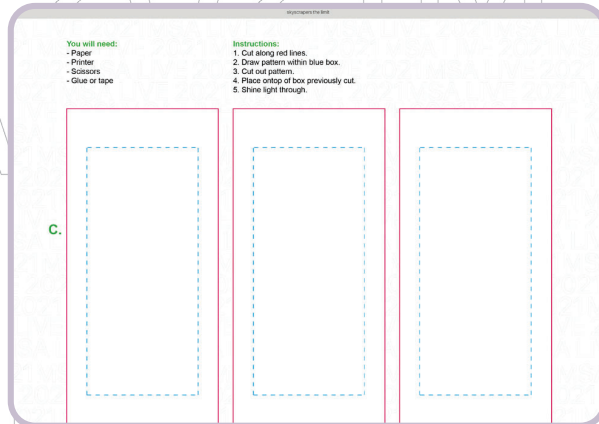
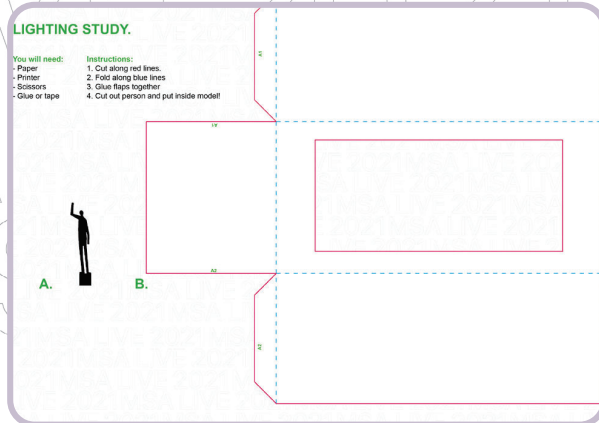
Light can also be used to warm up a space, not necessarily only to lit up.

Shadows in architecture help break up a vast amount of space. It also gives a building three dimensional feeling.

Natural shadow casted by natural light, creates a space with dynamic appearance as the shadow changes as the sun moves, giving life into the space.



## NET Template

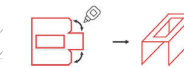


### PAPER A&B - MODEL BOX

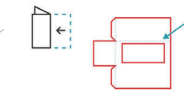
1 Cut along Red Lines



3 Glue Flaps Together



2 Fold along Blue Lines



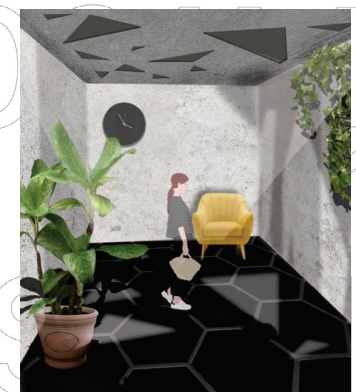
4 Cut out Person and Put inside the model



First week of the tasks in hand develops a series of architecture challenges, where students are able to explore different lighting conditions by creating patterns then overlaying them over a volume. The tasks released are design to encourage students to think more about their surroundings and how light penetrates through the spaces.

## Renders

As part of our work for the internal environments team we were tasked with creating a digital model which we could use to create internal renders. The first task was to create a digital model which we decided to make on sketchup, we went with a rectangular shape of which we removed one of the walls to allow for a view of the interior. The main focus of the task was on lighting and shadows therefore to achieve this we created perforated holes on the roof of the model which created interesting shadow patterns on the internal walls and floor when combined with the sun tool. We experimented with different perforated shapes including circles and squares to find the most successful shadow patterns, once we were happy with our model and shadows we turned to photoshop to render our most successful images. Once the renders were finished we added people and furniture to allow for a better understanding of scale and to give the environment a purpose.





## ABOUT

Each year the MSA Live (formerly Events) programme unites M Arch. year 01 with B Arch. year 01 and 02 and M Land. Arch 01 in mixed-year teams to undertake live projects with external partners to create social impact.

## LIVE PROJECTS

All MSA Live projects are live. A live project is where an educational organisation and an external partner develop a brief, timescale, and outcome for their mutual benefit.

## SOCIAL IMPACT

All MSA Live projects have social impact. Social impact is the effect an organization's actions have on the well-being of a community. Our agendas are set by our external collaborators.

## EXTERNAL PARTNERS

MSA LIVE projects work with many organisations: charities, community groups, social enterprises, community interest companies, researchers, practitioners and educators.

## STUDENT-LED

Our MSA masters students take the lead in the project conception, brief development, delivery and co-ordination of a small project. Other cohorts join for an eventful 2 weeks of activities at the end of the academic year.

## KNOWLEDGE TRANSFER

Working in teams within and across year groups and courses; MSA students participate in peer to peer learning. In addition, collaborators, participants and students engage in the transfer of tangible and intellectual property, expertise, learning and skills.

## LARGE SCALE

This year approximately 600 students from 4 cohorts in MSA will work on 42 projects with partners.

## QUESTIONS

For questions about MSA Live 21 contact MSA Live Lead: Becky Sobell:  
[b.sobell@mmu.ac.uk](mailto:b.sobell@mmu.ac.uk)

## BLOG

[live.msa.ac.uk/2021](http://live.msa.ac.uk/2021)

## SOCIAL

#MSALive21

@TheMSArch

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## WEBSITE

[www.msa.ac.uk](http://www.msa.ac.uk)